Cable Gland series

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1. SCOPE

1.1. Content

This specification covers the performance, tests and quality standards for Metal/Plastic cable gland. The cable glands are for the sealing and retention of cable of various series and sizes.

1.2. Qualification

When tests are performed, the following specified specifications and standards shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. In the case of a conflict between the requirements of this specification and the product drawing or of conflicts between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. TE Connectivity Documents

A. Customer drawing and name
Metal/Plastic cable gland series

2.2. Other Documents

- EN 61984: Connectors - Safety requirements and tests
- IEC 62444: Cable glands for electrical installations
- EN 60068: Environmental testing
- EN 60529: Degrees of Protection Provided by Enclosures (IP Code)
- ISO 6988: Metallic and other non-organic coatings - Sulfur dioxide test with general condensation of moisture

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Rated

- Operation Temperature -40°C ~+100°C
- Degree of Protection IP68

3.4. Performance and Test Description

Product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Paragraph 3.5. Unless otherwise specified, all tests shall be performed per IEC 62444.

3.5. Test Requirements and Procedures Summary

General			
No.	**Test Items**	**Requirements**	**Condition according to**
3.5.1	Visual and dimensional examination	Meets requirements of product drawing	Visual and dimensional examination per 7.1 of IEC 62444

Mechanical			
3.5.2	Durability of marking	Marking shall be still readable according to 6.2 of EN61984 (If marking made by impression, molding, pressing or engraving or the like are not subjected to this test)	Test piston: Size 1 Wet test with liquid: water Duration: 10 cycles Force:5N IEC 60068-2-70 Test Xb 7.3.2 of EN61984
3.5.3	Cable retention	The displacement of mandrel shall not exceed 3 mm.	Loading a force on mandrel and maintaining for 5 min. Loading force See IEC 62444 9.2.

3.5.4.1	Cable anchorage	The test mandrel shall not turn by more than an angle of 45°.	Twist test for 1 min, twist value See IEC 62444 Table 3. IEC 62444 9.3.
3.5.4.2	Cable anchorage (only for armoured cable)	The max slip allowed is less than 3mm.	Loading a force on mandrel and maintaining for 5 min. Loading force See IEC 62444 Table 2 Type C. IEC 62444 9.4

Environmental			
3.5.5	Cold	No damage likely to impair function	Subject mated specimen to -40℃ Duration time:16h, Test Ab Per IEC 60512-11-10 Test 11j (IEC 60068-2-1)
3.5.6	Dry Heat	No damage likely to impair function	Subject mated specimen to +100℃ Duration time:168h Test Bb Per IEC 60512-11-9 Test 11i (IEC 60068-2-2)
3.5.7	Degree of protection IP6X	No ingress of dust	Test IP 6X according to IEC 60529
3.5.8	Degree of protection IPX8	No ingress of water	Test IP X8 according to IEC 60529 Water immersion: 1m, 24Hours, No water immerge. 7.3.6.3&7.3.7of EN61984
3.5.9	Salt Mist Cyclic Test	No damage likely to impair function	Follow: ASTM B117-11 Test Condition: 1).Salt spray:（5±1）% NaCl（m/m） concentration solution; 2).Temperature（35±1）℃ 3). Precipitation rate of salt spray(1.0-2.0）ml（/ 80cm*h） 4).PH value：6.5-7.2 5).Duration:72H

Number of Specimen as below table:

Table 1 - Number of Specimen		
Test	**Description**	**Numbers**
Group A	Mechanical Strength Test	3 pairs of cable glands (3 pairs with minimum mandrel)
Group B	Degree of protection Test, Mated	3 pairs of cable glands (3 pairs with minimum mandrel)
Group C	Degree of protection Test, Mated	3 pairs of cable glands (3 pairs with minimum mandrel)
Group D	Salt Mist Cyclic Test	3 pairs of cable glands
Note: For connector family of the same design and comparable size, test may be made only on that member of the family which represents the worse case for that test.		

3.6. Test Sequence

Test or Examination	**Test Group**			
	A	B	C	D
	Test Sequence [1)]			
Visual and dimensional examination	1,5	1,5	1,5	1,3
Durability of marking	2			
Cable retention	3			
Cable anchorage	4			
Cold		3	3	
Dry Heat		4	4	
Degree of protection IP6X		2		
Degree of protection IPX8			2	
Salt Mist Cyclic Test				2

Notes:

1) Numbers indicate the sequence in which the tests are performed.

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production.

B. Test Sequence

The samples shall be prepared in accordance with product drawings. They shall be selected at random from current production.

4.2. Requalification Testing

If changes significantly affecting form, fit or functions are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of paragraph 3.5. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before re-submittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification. Bulk wire resistance shall be subtracted from resistance readings.